

Appl. No. 10/661,793  
Amdt. dated 07/06/2005  
Response to Office Action of 03/08/2005

Attorney Docket No.: TS01-1037  
N1085-90149

### **REMARKS/ARGUMENTS**

Claims 1-14 were previously pending in this application and claims 1-7 have been cancelled. Claim 12 has been amended. Claims 12-14 have been allowed. Applicants respectfully request re-examination, reconsideration and allowance of each of pending claims 8-11 as well as allowed claims 12-14.

Applicants and their undersigned representative thank the Examiner for the detailed analysis and arguments including figures from the references embedded in the Office action, which were very helpful.

#### **I. Allowable Subject Matter**

Applicants thank the Examiner for indicating, on page 9, third paragraph, that claims 12-14 are allowed. Claim 12 has also been amended to correct a typographical error as pointed out in the claim objection that appeared on page 2, fifth paragraph of the Office action.

#### **II. Rejection of Claims 8-11 Under 35 U.S.C. § 102(e) as being anticipated by Wu**

On page 3, numbered paragraph 1 of the Office action, claims 8-11 were rejected under 35 U.S.C. § 102(e) as being anticipated by Wu, et al. (U.S. Pub. 2005/0042523) hereinafter "Wu". Applicants respectfully submit that these claim rejections are obviated for reasons set forth below.

Unamended independent claim 8 recites the features of:

means, including a feedback mechanism, for assuring that said opening created through said layer of etch resist material is within design specification.

It is clear that it is the opening that is within design specification. After repeating this feature of claim 8, the Office action directs the reader to page 3, paragraph 19 of Wu. During the plasma-assisted etch process that is taught in paragraph 19 of Wu, only system parameters such as the RF plasma bias and ICP (inductively coupled plasma),

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are monitored (and utilized, according to subsequent paragraphs). Moreover, paragraph 19 of Wu discusses the etching process that takes place subsequent to the formation of the opening in the etch resist material. Wu is not directed to and therefore does not provide or suggest means for assuring that the OPENING is within design specification in paragraph 19 or elsewhere. Independent claim 8 is therefore distinguished from the reference of Wu and the rejection of claim 8 under 35 U.S.C. § 102(e) as being anticipated by Wu, should be withdrawn.

Claims 9-11 add further features of Applicants' invention and, by way of their dependency from claim 8, are also distinguished from Wu. As such the rejection of claims 9-11 under 35 U.S.C. §102(e) as being anticipated by Wu, should also be withdrawn.

**III. Rejection of Claims 8-11 Under 35 U.S.C. § 102(e) as being anticipated by Lymberopoulos**

On page 6, numbered paragraph 2 of the Office action, claims 8-11 were rejected under 35 U.S.C. § 102(e) as being anticipated by Lymberopoulos, et al (U.S. Pub. 2004/0092047), hereinafter "Lymberopoulos". Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

Lymberopoulos does not teach or suggest the claimed feature of "means, including a feedback mechanism, for assuring that the opening created through the layer of etch resist material is within design specification" that are recited in claim 8.

Rather, Lymberopoulos approaches the problem of controlling the critical dimensions (CD's) of the actual etched material – not the opening created through the layer of etch resist (photoresist) material – using practically an opposite approach. On page 5, paragraph 43, Lymberopoulos states "thus, the present invention adjusts the etch recipe based on two factors: (1) photoresist CD . . .". In paragraph 42 of column 5, Lymberopoulos states "The collected CD and depth data is supplied to processor 320; . . . Deviations from target results are used by the algorithm to adjust the etch recipe for

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the next wafer to be etched". Lymberopoulos therefore accepts the photoresist CD data as an input parameter and does not attempt to control this input parameter but rather, uses whatever photoresist CD is provided, to customize the etch recipe based on the photoresist CD and provide an etched CD within the desired specification limit.

5 Lymberopoulos does not attempt to control the photoresist CD.

Figure 2 of Lymberopoulos shows that the only feedback mechanism is from the trench CD map which is made after etching (arrow pointing back to processor 320). Again in Figure 3, the CD is monitored after etch (i.e. too late to do anything about the PR-CD) and the feedback goes back to step 3200 which determines the etch recipe to use. There is no feedback mechanism that influences the PR (photoresist) CD of steps 10 350, 3000 and 3100 in Lymberopoulos.

In sharp contrast, the present invention provides the advantage and is distinguished from Lymberopoulos because the claimed invention provides means, including a feedback mechanism, for assuring that the opening in the photoresist, i.e., 15 "the opening [itself] created through the layer of etch resist material", is within design specification. The present invention *actively controls* the photoresist CD with a feedback mechanism. Lymberopoulos does not even address this issue..

Independent, unamended claim 8 is therefore distinguished from Lymberopoulos. On pages 8-9 of the Office action, claims 9-11 are discussed and it was suggested that 20 "Wu" discloses the features of these claims. Based on the correlation of the pages and paragraphs cited in support of the arguments, and since the rejections were made under 35 U.S.C. § 102(e), it is believed that the Lymberopoulos reference was being discussed. Claim 8 is distinguished from Lymberopoulos for reasons set forth above, and therefore dependent claims 9-11 are also distinguished from Lymberopoulos and 25 the rejection of claims 8-11 under 35 U.S.C. § 102(e) as being anticipated by Lymberopoulos, should be withdrawn.

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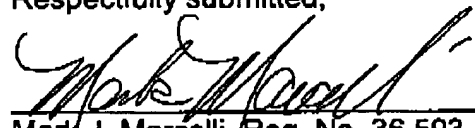
Moreover, Applicants further submit that the above-highlighted features of claim 8 distinguish Applicants' invention from the references of Wu and Lymberopoulos, taken alone or in combination.

### CONCLUSION

5 Based on the foregoing, each of claims 8-14 is in allowable form and the application is therefore in condition for allowance, which action is respectfully and expeditiously requested.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this  
10 communication to Deposit Account 04-1679.

Respectfully submitted,



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